

MT3S20TU

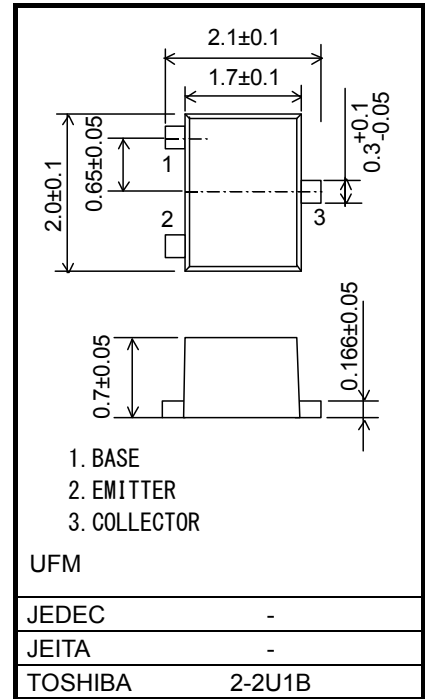
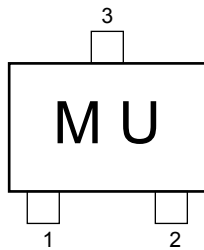
VHF-UHF Band Low-Noise, Low-Distortion Amplifier Applications

Unit: mm

FEATURES

- Low Noise Figure: NF = 1.45dB (typ.) (@ f=1GHz)
- High Gain: $|S_{21e}|^2 = 12\text{dB}$ (typ.) (@ f=1GHz)

Marking



Weight: 6.6mg (typ.)

Absolute Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	20	V
Collector-emitter voltage	V_{CEO}	12	V
Emitter-base voltage	V_{EBO}	1.5	V
Collector current	I_C	80	mA
Base current	I_B	10	mA
Collector power dissipation	$P_C(\text{Note1})$	900	mW
Junction temperature	T_j	150	°C
Storage temperature range	T_{stg}	-55 to 150	°C

Note.1 : The device is mounted on a ceramic board (25.4 mm x 25.4 mm x 0.8 mm (t))

Note.2 : Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

Start of commercial production
2008-02

Microwave Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Transition frequency	f_T	$V_{CE} = 5V, I_C = 30mA$	5	7	—	GHz
Insertion gain	$ S_{21e} ^2(1)$	$V_{CE} = 5V, I_C = 50mA, f = 500MHz$	—	17.5	—	dB
	$ S_{21e} ^2(2)$	$V_{CE} = 5V, I_C = 50mA, f = 1GHz$	10	12	—	
Noise figure	NF	$V_{CE} = 5V, I_C = 20mA, f = 1GHz$	—	1.45	2	dB
3 rd order intermodulation distortion output intercept point	OIP3	$V_{CE} = 5V, I_C = 50mA, f = 500MHz, \Delta f = 1MHz$	26	30	—	dBmW

Electrical Characteristics (Ta = 25°C)

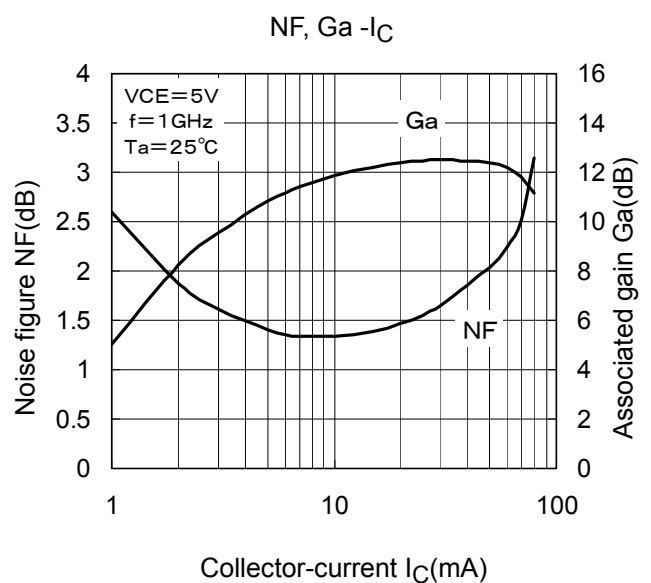
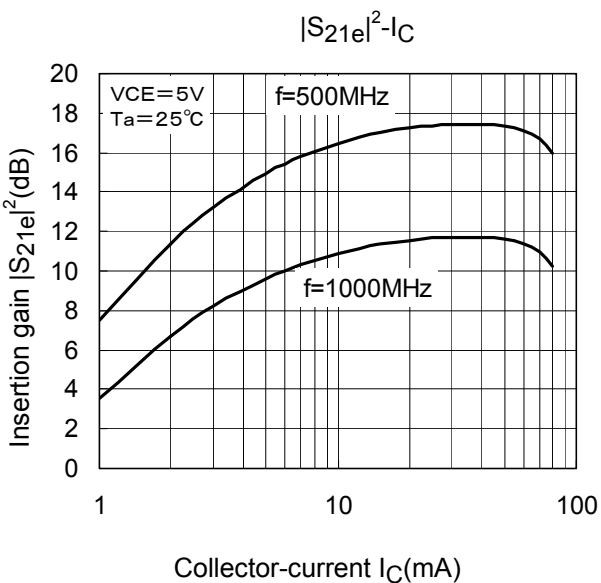
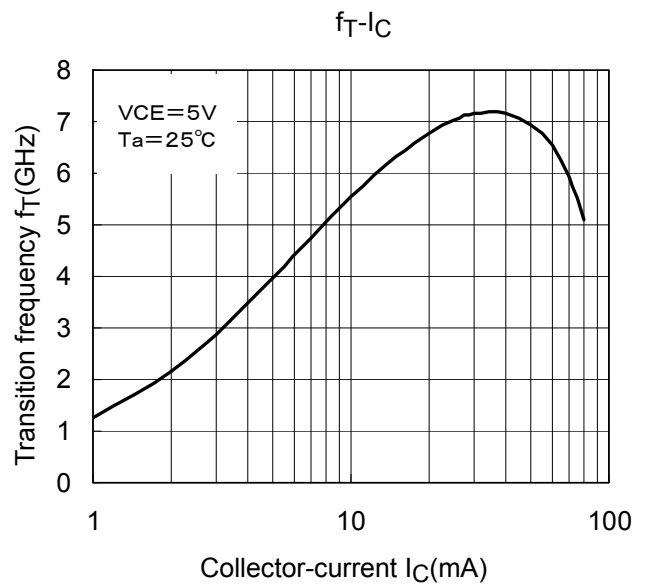
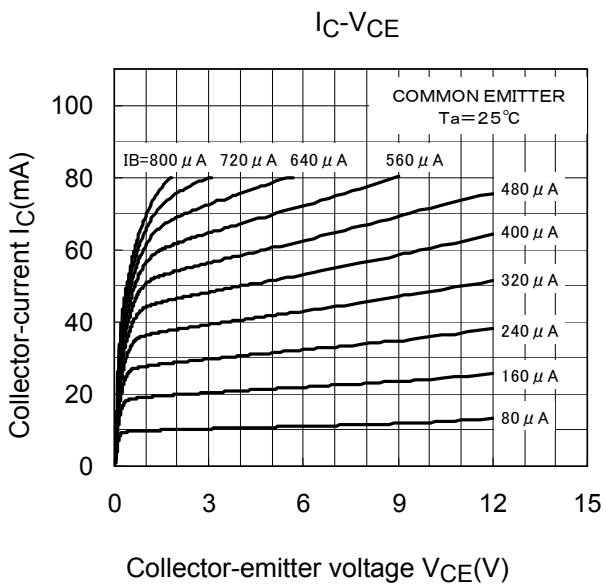
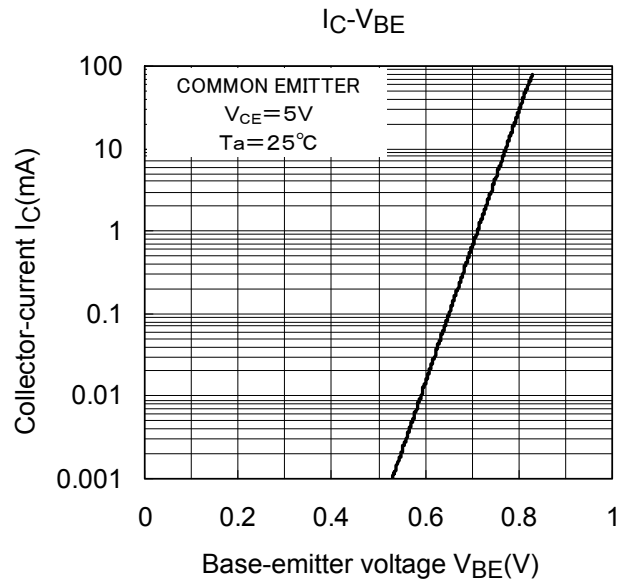
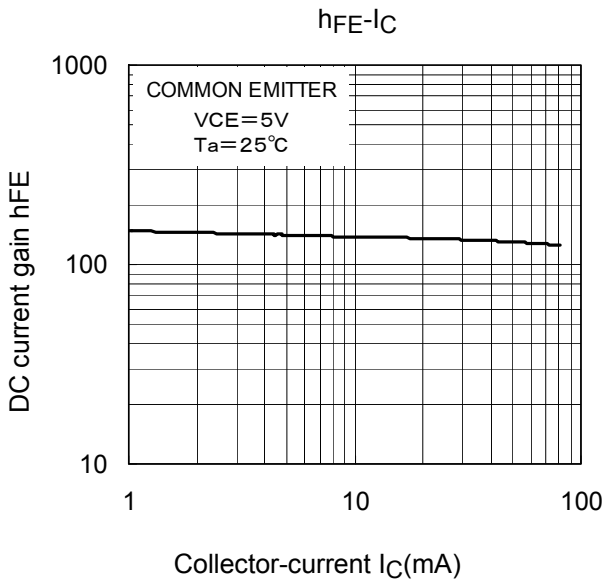
Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Collector cut-off current	I_{CBO}	$V_{CB} = 10V, I_E = 0$	—	—	0.1	μA
Emitter cut-off current	I_{EBO}	$V_{EB} = 1V, I_C = 0$	—	—	0.5	μA
DC current gain	h_{FE}	$V_{CE} = 5V, I_C = 50mA$	100	150	200	—
Reverse transfer capacitance	C_{re}	$V_{CB} = 5V, I_E = 0, f = 1MHz$ (Note3)	—	0.75	1	pF

Note.3 : C_{re} is measured using a 3-terminal method with capacitance bridge

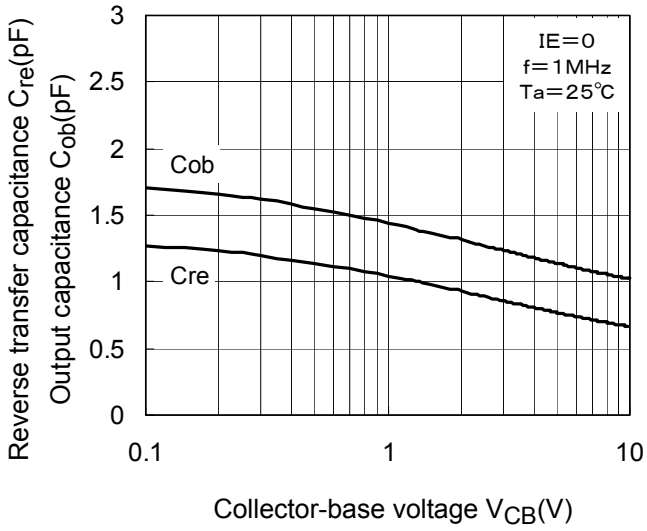
Caution:

This device is sensitive to electrostatic discharge.

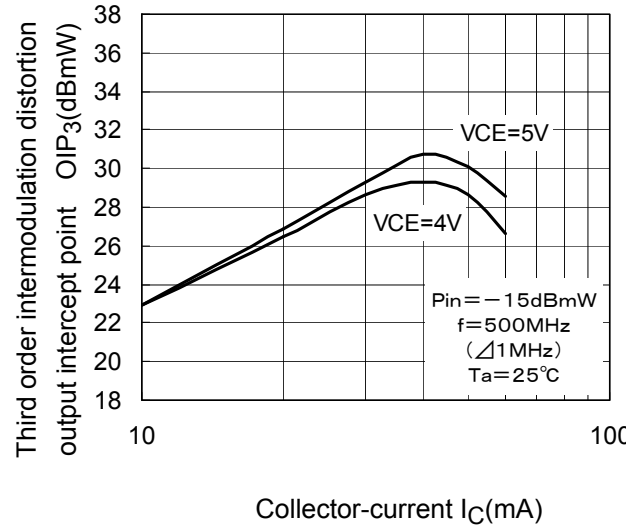
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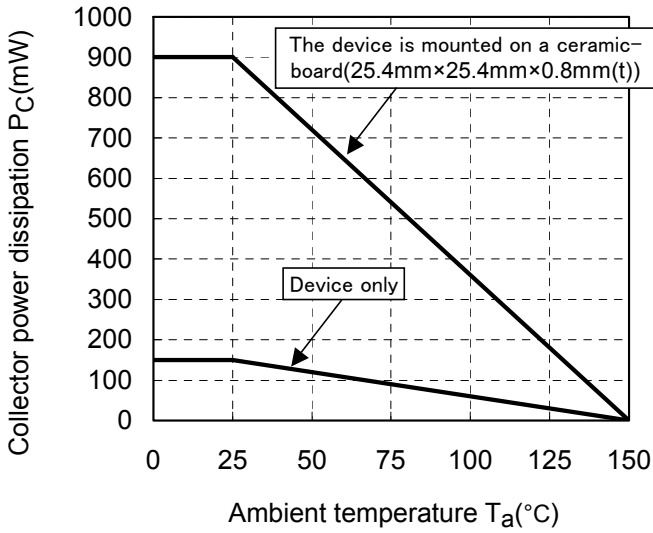
$C_{re}, C_{ob}-V_{CB}$



OIP₃-I_C



P_C-T_a



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